[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[FIELD OF THE INVENTION] The present invention relates to a door handle of a refrigerator.

[0002]

[DESCRIPTION OF THE RELATED ART] FIG. 10 is an incised side view illustrating a main part of a conventional refrigerator. As shown, an insulation casing 1 interposes an insulation wall 4 formed of an insulation foaming material between an outer casing 2 and an inner casing 3 to form a main body. A handle 5, a handle base 6 supporting the handle 5, and a door 7 including the insulation wall 4 are provided to a front opening part of the main body. The handle 5 is elongated to correspond to approximately all vertical length of the door 7. Thus, a user can easily grasp any places of the handle 5 to open and close the door 7 irrespective of his/her stature.

[0003] FIG. 11 is a detailed view of a main part in FIG. 10. As shown, the handle 5 is supported to the handle base 6, and the handle base 6 is coupled to the door 7 through a screw 10. A handle cover 9 is detachably coupled by a fingernail, and a draining hole 6b is provided to a bottom of a pipe part 6c to which the handle 5 is inserted to be coupled to the handle base 6. The conventional refrigerator is disclosed in Japanese Patent First

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[0004]

[PROBLEM TO BE SOLVED] If the handle 5 of the conventional refrigerator is molded by means of an injection to have a length more than 300mm, the flexural strength thereof decreases. To strengthen the handle 5, the diameter thereof should be bigger or a metal plate should be used thereto, and accordingly, a design or an easy grasping thereof may be deteriorated.

[0005] In the case that a metal plate is used to the handle 5, water, detergent or the like is permeated into a gap 6a between the handle and the handle base 6 to rust or corrode the metal plate when the handle 5 is cleaned by a wet dish towel or detergent.

[0006] To solve the problem, it is an aspect of the present invention to provide a door handle of a refrigerator and a manufacturing method for the same having an elliptical section, a thickness, and a sufficient length to be easily grasped, being prevented from rusting or corroding despite being cleaned with water or detergent, having an excellent design, and reducing cost.

[0007] A door handle of a refrigerator formed of a hollow steel pipe, the surface of which is baking finished.

[0008] The steel pipe is formed of stainless steel.

[0009] The handle is formed with a round R.

[0010] The round R has a radius more than 2000mm.

[0011] An inner height of opposite sides of the handle is more than 10mm.

[0012] The door handle of the refrigerator comprises a synthetic resin handle base coupled to a door together with the handle to absorb a size difference from a round shape of the door for enhancing design.

[0013] The handle base and the handle have a coupling configuration to prevent the handle base from rotating.

[0014] The door handle of the refrigerator comprises a screw plate fixing the handle, and having a size bigger than the handle base.

[0015] A burr of a screw plate fixing the handle or a burr generated in a forming process has a direction opposite to a door panel.

[0016] The door handle of the refrigerator comprises a handle cover detachably coupled to the handle base, and being employed for hiding the handle base to enhance design.

[0017] The handle cover is formed of a thermoplastic resin.

[0018] A handle cover and the handle base are coupled in a position which is invisible from a front view of the refrigerator.

[0019] The steel pipe has an elliptical section, to be fitly grasped.

[0020] An end part of the steel pipe is press worked so that configurations for preventing water from permeating and for fixing the door are formed at once.

[0021] The handle cover for enhancing design hides a transformed part formed when the end part of the steel pipe is press worked so that the configurations for preventing water from permeating and for fixing the door are formed at once.

[0022] An end part of the pressed part of the steel pipe is erected.

[0023] A manufacturing method for a door handle of a refrigerator, comprises deforming a hollow steel pipe to have a predetermined shape by means of a plastic deformation; and baking finishing a surface of the steel pipe.

[0024] The steel pipe is baking finished with being hanged to a hanger.

[0025]

[DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION] First embodiment: Hereinafter, a first embodiment of the present invention will be described by referring to the accompanying drawings. FIGs. 1 to 4 illustrate a first embodiment of the present invention, FIG. 1 is a front view illustrating a door handle of a refrigerator, FIG. 2 is a sectional view taken along link

Z-Z in FIG. 1, FIG. 3 is a side view illustrating the door handle of the refrigerator, and FIG. 4 illustrates an installation of the door handle and a handle base.

[0026] As shown in FIG. 2, a surface of a handle 5 is baking finished for enhancing a design and rust prevention. For example, a steel pipe of cold rolled steel materials is applied for the handle 5. The handle 5 is formed of the steel pipe by a plastic deformation, and then a baking finish is processed thereto. Thus, compared with a handle formed after a steel pipe and a resin film are extrusion-molded together, a forming restriction can be reduced because a flaw or discoloration owing to extending of a resin is prevented. Also, the handle 5 is provided within 94.3 to 124.4cm to be conveniently grasped by average Japanese. Also, the opposite sides of the handle 5 have rounds R to enhance an external appearance.

[0027] Also, since the baking finish is performed while the steel pipe is hanged to a hanger after being formed, mass production thereof is possible to reduce cost. A synthetic resin handle base 6 coupled to a door 7 together with the handle 5 through a screw 10 absorbs a size difference from a round shape of the door 7 to hide a coupling part (the opposite parts) of the handle 5, thereby enhancing integrality or design.

[0028] When the handle 5 or the handle base 6 is

replaced, the screw 10 should be unscrewed. Thus, a handle cover 9 is detachably coupled to the handle base 6. The handle cover 9 is detached therefrom by a fingernail through elasticity of plastic. Also, the handle cover 9 is employed for hiding the screw 10 to enhance design thereof.

[0029] A screw plate 22 fixes the screw 10, and a burr 23 is formed to an end part of the screw plate 22. The handle 5 and the handle base 6 are coupled to the screw plate 22 via a door panel 7a. The screw plate 22 has an area bigger than the handle base 6. The burr 23 of the screw plate 22 has a direction opposite to the door panel 7a.

[0030] With this configuration, although a force is applied to the handle 5, a rising or a vestige of the screw plate 22 can be prevented to the door panel 7a, thereby enhancing aesthetic appreciation.

[0031] Alternatively, as a rust prevention processing, plating may be accomplished in one layer or multi layers before coating. Also, alternatively, a stainless steel pipe may be used. Thus, rusting or corroding can be prevented, and an advanced design can be provided.

[0032] Also, when the handle 5 formed of a steel pipe round is formed with a round, a hollow (M-M shape) inside of the handle 5 may be damaged. Thus, as shown in FIG. 3, it is preferable that a round of the handle 5 has a radius

X more than 2000mm, to thereby be prevented from being damaged.

[0033] Also, the handle 5 formed with a round has a height Y bigger than the thickness of a thumb in a position in which a gap between the door and the handle 5 is smallest, and inner sides of the handle base and the handle cover have a rounded shape, etc. without making an acute angle. Thus, a hand of a user can be prevented from being caught therein.

[0034] As shown in FIG. 4, the handle cover has a shape to hide a transformed part 20 which is transformed when the opposite sides of the handle 5 is processed by a press working, etc. Thus, design thereof can be enhanced.

[0035] The handle cover is preferably formed of a thermoplastic resin to facilitate assembling and dissembling thereof.

[0036] FIGs. 4(a) and 4(b) respectively illustrate the handle base 6 and the handle 5, and FIG. 4(c) illustrates an assembly of the handle base 6 and the handle 5. The handle base 6 and the handle 5 have coupling shapes to be easily assembled, and to prevent the handle base from rotating referring to enlarged part Z. Thus, the handle 5 and the handle base 6 can be easily installed to the door, and the handle base 6 can be stably installed thereto.

[0037] Second embodiment: FIG. 5 is a sectional view

taken along Y-Y in FIG. 1. As shown in FIG. 3, a door handle has an elliptical section to be easily grasped, and has a sleek and clean appearance in a side view thereof. Thus, a door handle of a refrigerator can be provided to have an advanced design.

[0038] Third embodiment: FIG. 6 illustrates a door handle of a refrigerator according to a third embodiment of the present invention in detail. As shown, the opposite sides of a handle 5 are under pressure welding by a press working. Thus, water can be prevented from permeating into the handle 5. Also, although water on a surface of the handle 5 is transferred to inflow into a handle base 6, it can be promptly drained through a coupling part of the handle base 6 and a handle cover 9.

[0039] Accordingly, a separate drainage can be omitted, and restriction on forming the handle base 6 and the handle cover 9 can be reduced.

[0040] Fourth embodiment: FIG. 7 illustrates a door handle of a refrigerator according to a fourth embodiment of the present invention in detail. As shown, a flange 5a is provided to a pressure welded part by means of a press working. Thus, when a handle 5 is coupled to a door 7 through a screw 10 or the like, although a screwdriver 11 gets derailed from the screw 10, the flange 5a can protect a door panel 7a to be prevented from being damaged by the

screwdriver 11.

[0041] Also, the flange 5a prevents an end part of the handle from expanding by means of a press working. Thus, the width of a handle cover can be decreased to enhance design thereof.

[0042] Fifth embodiment: FIGs. 8 and 9 illustrate a fifth embodiment. FIGs. 8 and 9(a) are perspective views illustrating a door handle cover of a refrigerator, and FIG. 9(b) is a view along a direction A in FIG. 9(a). As shown, a handle base 6 and a divided part (component divided line) 21 of a handle cover 9 are positioned to be invisible when a refrigerator is viewed from a front.

[0043] Also, the handle base 6 and the divided part 21 of the handle cover 9 are positioned behind the handle 5, and have a width smaller than the handle 5 so that the handle base 6 and the divided part 21 is invisible when being viewed from opposite sides as well as a front. Thus, aesthetic design thereof can be improved.

[0044] Alternatively, the handle base 6 and the handle cover 9 may be integrally formed, and configured by means of a insert mold with the handle 5.

[0045]

[EFFECT OF THE INVENTION] The door handle of the refrigerator according to the present invention is formed of the hollow steel pipe, the surface of which is baking

finished. Thus, the present invention can provide the door handle highly expressed with the feel of metal to enhance design thereof. Also, since forming cost is lower than injection molding, the present invention can provide the door handle with a low cost.

[0046] Since the stainless steel pipe is applied thereto, the present invention can provide the door handle highly expressed with the feel of metal to enhance design thereof. Also, since forming cost is lower than injection molding, the present invention can provide the door handle with a low cost.

[0047] Since the handle is formed with the round R, the opposite sides of the handle can reduce the feel of protrusion to supply a sleek and clean impression.

[0048] Since the round R has a radius more than 2000mm, leakage can be prevented.

[0049] Since the inner height of opposite sides of the handle is more than 10mm, a hand of a user can be prevented from being caught therein.

[0050] Since the synthetic resin handle base for enhancing design is coupled to the door together with the handle, a size difference from a round shape of the door can be absorbed.

[0051] Since the handle base and the handle have a coupling configuration to prevent the handle base from

rotating, the handle base can be stable.

[0052] Since the screw plate fixing the handle has a size bigger than the handle base, although a force is applied to the handle in use, a problem can be prevented.

[0053] Since the burr of the screw plate fixing the handle or the burr generated in the forming process has a direction opposite to a door panel, a vestige can be prevented from being remained to the door panel.

[0054] Since the handle cover is detachably coupled to the handle base, design can be enhanced.

[0055] Since the handle cover is formed of a thermoplastic resin, the handle cover can be easily assembled and dissembled.

[0056] Since the handle cover and the handle base are coupled in a position which is invisible from a front view of the refrigerator, design can be enhanced.

[0057] Since the steel pipe has an elliptical section to be fitly grasped, the refrigerator can have a sleek and clean impression from a side view, thereby enhancing design.

[0058] Since an end part of the steel pipe is press worked so that configurations for preventing water from permeating and for fixing the door are formed at once, a separate drainage can be omitted, and restriction on deforming the handle base and the handle cover can be reduced.

[0059] Since the handle cover for enhancing design hides a transformed part formed when the end part of the steel pipe is press worked so that the configurations for preventing water from permeating and for fixing the door are formed at once, design can be enhanced.

[0060] Since an end part of the pressed part of the steel pipe is erected, when the handle is coupled to the door through the screw, although a screwdriver is derailed from the screw, the erected flange can prevent the door panel from being damaged by the screwdriver.

[0061] Since the manufacturing method for the door handle of the refrigerator deforms the hollow steel pipe to have a predetermined shape by means of a plastic deformation, and then baking finishes the surface of the steel pipe. Thus, compared with a handle formed after a steel pipe and a resin film are extrusion-molded together, forming restriction can be reduced because a flaw or discoloration owing to extending of a resin is prevented.

[0062] Since the steel pipe is baking finished with being hanged to a hanger, mass production is possible to reduce cost.

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 is a front view illustrating a door handle of a refrigerator according to a first embodiment of the present invention;

FIG. 2 is a sectional view taken along link Z-Z in FIG. 1;

FIG. 3 is a side view illustrating the door handle of the refrigerator in FIG. 1;

FIG. 4 illustrates an installation of the door handle and a handle base in FIG. 1;

FIG. 5 is a sectional view taken along link Y-Y in FIG. 1 illustrating a door handle of a refrigerator according to a second embodiment of the present invention;

FIG. 6 is a detailed view illustrating a door handle of a refrigerator according to a third embodiment of the present invention;

FIG. 7 is a detailed view illustrating a door handle of a refrigerator according to a fourth embodiment of the present invention;

FIG. 8 is a perspective view illustrating a door handle cover of a refrigerator according to a fifth embodiment of the present invention;

FIG. 9 illustrates the door handle cover of a refrigerator in FIG. 8;

FIG. 10 is an incised side view illustrating a main part of a conventional refrigerator; and

FIG. 11 is a detailed view of a main part in FIG. 10.